



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,693	01/05/2004	JON A. CASEY	FIS920030334US1	1692
29505	7590	07/24/2006	EXAMINER	
DELIO & PETERSON, LLC 121 WHITNEY AVENUE NEW HAVEN, CT 06510			TOLEDO, FERNANDO L	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 07/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

8

Office Action Summary	Application No. 10/707,693	Applicant(s) CASEY ET AL.	
	Examiner Fernando L. Toledo	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-20 and 31 is/are allowed.
- 6) ☒ Claim(s) 21-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 21 – 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoude et al. (U. S. Patent 5,337,475 A) in view of Horiguchi et al. (U. S. Patent 5,616,956 A).

3. In re claim 21, Aoude in the U. S. Patent 5,337,475 A; discloses, a method of filling vias in a silicon substrate, said method comprising; obtaining a silicon substrate having a plurality of via holes; filling said vias with a high-solids loading paste including a conductor material and a low CTE additive material; and sintering said silicon substrate and paste at a temperature for densification of said metal (Columns 3 – 5).

Aoude does not disclose wherein the paste is a binder-free paste. However, Horiguchi, in the U. S. Patent 5,616,956 A; figures 1 – 2 and related text, discloses wherein the loading paste is binder-free (column 5, lines 60 – 65) since a highly reliable circuit substrate with no peeling of the conductive layer from the insulating layer can be produced (column 6, lines 5 – 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the loading paste of Aoude be binder-free, since as taught by Horiguchi, a

Art Unit: 2823

binder-free loading paste would produce a highly reliable circuit substrate with no peeling of the conductive layer from the insulating layer.

4. In re claim 22, Aoude teaches further comprising having said paste in the range of 50 to 55 volume percent solids (Column 4, Lines 8 – 28).

5. In re claim 23, Aoude discloses including filling said vias with a metal powder (Column 4, Lines 8 – 12).

6. In re claim 24, Aoude discloses wherein said metal powder comprises copper, silver or gold powder (Column 4, Lines 30 – 35).

7. In re claim 25, Aoude discloses further including adding solvents and dispersants said high-solids loading paste (Column 4, Lines 8 – 35).

8. In re claim 26, Aoude discloses wherein said paste includes a high-solids loading of approximately greater than 50 to 55 volume percent solids (Column 4, Lines 8 – 35).

9. In re claim 27, Aoude discloses wherein said paste has a suspension viscosity below approximately 1000 centipoise (Column 4, Lines 24 – 28).

10. In re claim 28, Aoude discloses including filling with said low CTE additive comprising a conductor, an insulator, or mixture of both (Column 4, Lines 8 – 35).

11. In re claim 29, Aoude discloses wherein said low CTE additive material comprises silica, cordierite, spodumene, borosilicate glasses, mullite, beta eucryptite, tungsten, magnesium aluminosilicate, or molybdenum (Column 9, Line 6).

12. In re claim 30, Aoude discloses wherein said paste includes said low CTE additive material in a range of 20 – 80 volume percent (Column 4, Lines 30 – 35).

Art Unit: 2823

13. In re claim 30, Aoude discloses wherein said paste includes an amount of said conductor material is in the range of 20 – 80 volume percent (Column 4, Lines 30 – 35).

Response to Arguments

14. Applicant's arguments with respect to claims 21 – 30 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

15. Claims 1 – 20 and 31 are allowed over the prior art of record.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 2823

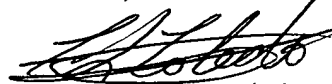
however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fernando L. Toledo whose telephone number is 571-272-1867.

The examiner can normally be reached on Mon-Fri 12pm-7:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Fernando L. Toledo
Patent Examiner
Art Unit 2823

flt
17 July 2006